



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,537	08/16/2001	Thomas G. Coleman	5308-159	3269
20792	7590	10/09/2003	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC			SONG, MATTHEW J	
PO BOX 37428			ART UNIT	
RALEIGH, NC 27627			PAPER NUMBER	

1765

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Advisory Action</b>	<b>Application No.</b> 09/931,537	<b>Applicant(s)</b> COLEMAN, THOMAS G.	
	<b>Examiner</b> Matthew J Song	<b>Art Unit</b> 1765	

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 08 September 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

**PERIOD FOR REPLY [check either a) or b)]**

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.  
ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on \_\_\_\_\_. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
  - (b) ☐ they raise the issue of new matter (see Note below);
  - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
  - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_

3. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.
4. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: see continuation sheet.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☐ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: \_\_\_\_\_.

Claim(s) objected to: \_\_\_\_\_.

Claim(s) rejected: \_\_\_\_\_.

Claim(s) withdrawn from consideration: \_\_\_\_\_.

8. ☐ The proposed drawing correction filed on \_\_\_\_\_ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_.
10. ☐ Other: \_\_\_\_\_

**NADINE G. NORTON**  
**PRIMARY EXAMINER**

***Response to Arguments***

**Continuation of Item 5:**

Applicant's arguments filed 9/8/2003 have been fully considered but they are not persuasive.

Applicant's argument that Pinkahsov does not teach sublimation is noted (Item A) but is not found persuasive. Applicant cites passages of Pinkahsov, which teach molten material is vaporized for purposes of growing a material on a substrate; however, Pinkahsov is not as limited as suggested by applicant. Pinkahsov teaches an arc is generated between electrodes and cause the evaporation of the material from one electrode so that this material is deposited on the substrate, note column 1, lines 34-43, which reads on applicant's sublimation because solid electrodes are evaporated without forming a molten pool. Also note Claim 5, which claims arc vapor deposition by striking electric arcs between an electrode body and another electrode to vaporize the electrode material. Therefore, Pinkahsov does not does not require a molten pool, as suggest by applicant. Furthermore, Pinkahsov's invention is directed to providing an improved method of making an electrode for arc-vapor deposition (col 2, ln 1-15) and is not limited to embodiment taught by Pinkahsov, where the electrodes are repeatedly struck together. It is also noted that Smalley et al teaches a method of electric arc processing, where electrode material is vaporized without forming a molten pool (col 4, ln 34-40).

Applicant's argument that Pinkahsov is not enabled for a silicon carbide electrode (Item B) is noted but is not found persuasive. Pinkahsov teaches the electrode material is silicon carbide, note column 2, lines 47-49. Pinkahsov also teaches material from one electrode in a compound state is deposited upon a substrate, note Column 1, lines 34-43. The teachings of

Art Unit: 1765

Pinkahsov do not require forming a molten pool of material, as discussed previously, therefore applicant's argument that a molten Silicon carbide cannot be formed is moot.

In response to applicant's argument that there is no suggestion to combine the references (Item C), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kuehnle teaches vaporizing an electrode material at a steady level, by maintaining a constant energy flow between electrodes, which is desirable because the amount of vaporized material will result in a desired single crystal growth upon a seed crystal, as taught by Davis et al (Re 34,861), note column 6, lines 60-68 and column 7, lines 20-26. Smalley et al teaches an electric arc process, where a consistent arc gap is maintained between electrodes and it is necessary to provide means for maintaining the arc gap within certain limits and an optimum length of the arc gap (col 4, ln 34-50).

Applicant's argument that Pinkahsov teaches away from maintaining a constant gap (Item C) is noted but is not found persuasive. Pinkahsov teaches a method of electric arc vapor deposition using silicon carbide electrodes (col 2, ln 45-50). Pinkahsov's invention is directed to the method of making an improved electrode for arc-vapor deposition, note column 2, lines 1-12. The method of repeatedly striking electrodes together is merely a particular method of electric arc vapor deposition used by Pinkahsov to illustrate the use of the improved electrode. Also, Pinkahsov is not limited to this particular embodiment, as suggested by applicant, because

Art Unit: 1765

Pinkahsov teaches a general arc vapor deposition process, where the electrodes are not repeatedly struck together, note column 1, lines 29-45. Therefore, the improved electrode for arc vapor deposition taught by Pinkahsov can be combined with the known process of electric arc vapor deposition taught by Smalley and Kuehnle.

Applicant's arguments that claim 33 (Item D) is patentable are noted but are not found persuasive. Applicant alleges the combination of Pinkahsov, Kuehnle and Davis does not teach using an electric arc to create a local high temperature within the furnace..... maintaining the inner walls of the furnace at a temperature below the temperature at which silicon carbide sublimates. However, the applicant admits that Kuehnle teaches a "cold" inert gas is flowed just inside the housing sidewall, which reads on applicant's maintaining the inner walls at a temperature below the temperature at which silicon carbide sublimates. Applicant's alleges that the reference fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the housing is heated) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant alleges that Kuehnle teaches cooling the housing and does not teach heating. However, the instant claim 33 does not require heating the inner walls of the furnace.

Applicant's argument that claims 11, 12 and 15 are patentable (Item E) are noted but are not found persuasive. Davis teaches maintaining a pressure of 10 Torr for six hours resulting in a 6 mm thick SiC crystal; note column 13, lines 1-25, as previously stated in the Final Rejection on Page 3. Davis also teaches other parameters of the process can be appropriately controlled to result in the desired single crystal growth upon the seed crystal, note column 7, lines 20-26. The

Art Unit: 1765

teaching of Davis read on applicant's limitation of a constant pressure level is set to ensure that a specific polytype of silicon carbide is grown.

In response to applicant's argument that the combination of Pinkahsov, Davis and Kuehnle or the combination of Pinkahsov, Davis and Smalley does not teach so as to maintain the end of the silicon carbide electrode adjacent the gap at a substantially constant temperature during the sublimation process (Item F), a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The combination of Pinkahsov, Davis and Kuehnle or the combination of Pinkahsov, Davis and Smalley teaches maintaining a constant temperature and a constant gap between electrodes to maintain a constant flux, therefore would be capable of performing the claimed intended use because a similar method of maintaining temperature and an electrode gap is taught.